



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,988	08/31/2001	Cass W. Everitt	NVIDP053/P000328	1889

28875 7590 03/26/2004

SILICON VALLEY INTELLECTUAL PROPERTY GROUP  
P.O. BOX 721120  
SAN JOSE, CA 95172-1120

EXAMINER

HARRISON, CHANTE E

ART UNIT

PAPER NUMBER

2672

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/944,988

**Applicant(s)**

EVERITT ET AL.

**Examiner**

Chante Harrison

**Art Unit**

2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is responsive to the following communications: Application, filed 08/31/2001; IDS, paper #3, filed 06/17/2002.
2. Claims 1-29 are pending in this application. Claims 1 and 23-29 are independent claims.
3. The present title of this application is "Order-independent Transparency Rendering System and Method" (as originally filed).

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Chauvin et al., U.S. Patent 6,008,820, 12/1999.

As per independent claim 1, Chauvin discloses a method for transparency rendering in a graphics pipeline comprising: a) collecting colored-transparency information from a plurality of depth layers in a scene to be rendered (i.e. reading/retrieving image data from memory, where the image data includes texture data for which pixel data is generated, where the pixel data includes color and alpha data for polygons that are to be rendered) (col. 18, ll. 50-60; col. 19, ll. 10-18) b) storing the

Art Unit: 2672

collected colored-transparency information in memory (Fig. 4A) and c) blending the colored-transparency information from the depth layers in a predetermined order (col. 60, ll. 14-29).

With respect to dependent claim 2, Chauvin discloses the colored-transparency information is collected from at least two depth layers (col. 4, ll. 15-30).

With respect to dependent claim 3, Chauvin discloses the colored-transparency information is stored in a plurality of texture maps (col. 8, ll. 21-28; col. 31, ll. 15-20).

With respect to dependent claim 4, Chauvin discloses the texture maps corresponds with one of the depth layers (abstract; col. 31, ll. 15-20).

With respect to dependent claim 5, Chauvin discloses the texture maps are stored in memory (col. 8-9, ll. 61-5; col. 18, ll. 50-60).

With respect to dependent claim 6, Chauvin discloses rendering opaque objects (i.e. a fixed background) in the scene (col. 4, ll. 15-30).

With respect to dependent claim 7, Chauvin discloses the opaque objects in the scene are rendered prior to blending the colored-transparency information therewith (col. 60, ll. 15-28; col. 39, ll. 44-52).

With respect to dependent claim 8, Chauvin discloses the memory includes a frame buffer (col. 8-9, ll. 60-5).

With respect to dependent claim 9, Chauvin discloses blending includes linear blending (col. 18, ll. 27-34).

With respect to dependent claim 10, Chauvin discloses the colored-transparency information is collected utilizing depth peeling (col. 22, ll. 2-12).

With respect to dependent claim 11, Chauvin discloses depth peeling includes executing a first rendering pass for collecting colored-transparency information relating to a first depth layer . . . collecting . . . information relating to additional depth layers (col. 18, ll. 50-60; col. 19, ll. 10-18).

With respect to dependent claim 12, Chauvin discloses the first rendering pass produces a shadow map relating to the first depth layer (col. 18, ll. 50-60).

With respect to dependent claim 13, Chauvin discloses a shadow-mapping feature is enabled during the additional rendering passes for defining a previous depth layer (col. 18, ll. 50-60; col. 19, ll. 18-26).

With respect to dependent claim 14, Chauvin discloses additional rendering passes are taken from the same eye position from which the first rendering pass is taken (Fig. 5A).

With respect to dependent claim 15, Chauvin discloses information is collected utilizing depth peeling including a first rendering pass for generating a shadow map from which first colored-transparency information . . . is collected . . . (col. 22, ll. 2-12), executing additional rendering passes . . . from the same eye position (Fig. 5A).

With respect to dependent claim 16, Chauvin discloses information relating to the additional depth layers is collected by removing a portion of the scene . . . (col. 41, ll. 25-58).

With respect to dependent claim 17, Chauvin discloses additional depth layers is collected by performing a test to determine which portion of the scene to remove (col. 41, ll. 25-58).

With respect to dependent claim 18, Chauvin discloses the test determines whether the portion of the scene is behind the previous depth layer (col. 42, ll. 30-60).

With respect to dependent claim 19, Chauvin discloses portion of the scene is removed upon the test determining that the portion of the scene is behind the previous depth layer (i.e. non-overlapping image data is culled away) (col. 41, ll. 52-60).

With respect to dependent claim 20, Chauvin discloses the test calculates a difference between a previous z-value relating to the previous depth layer and a present z-value . . . (i.e. occlusion test) (col. 41, ll. 52-60).

With respect to dependent claim 21, Chauvin discloses the portion of the scene is removed upon no difference being calculated . . . (i.e. image space recursive subdivision) (col. 41, ll. 40-51).

With respect to dependent claim 22, Chauvin discloses the z-values relating to all depth layers are produced with the same interpolation-related method for improving an accuracy of the test (col. 19, ll. 5-10).

As per independent claim 23, Chauvin discloses a computer program product . . . (col. 7, ll. 30-41) for implementing the method of claim 1. Therefore the rationale applied in the rejection of claim 1 applies herein.

As per independent claim 24, Chauvin discloses a system for transparency rendering . . . comprising: a) logic for collecting . . . information . . . (Fig. 3 & 5A; col. 18, ll. 50-60; col. 19, ll. 10-18); b) memory for storing . . . information (Fig. 4A); and c) a

Art Unit: 2672

renderer coupled to the memory for blending the . . . information from the depth layers in a predetermined order (Fig. 4A & 21A; col. 60, ll. 14-29).

As per independent claim 25, Chauvin discloses a system for transparency rendering . . . comprising: a) logic for collecting . . . information . . . (Fig. 3 & 5A; col. 18, ll. 50-60; col. 19, ll. 10-18); b) memory for storing . . . information (Fig. 4A); and c) register combiners coupled to the memory for blending the . . . information from the depth layers in a predetermined order (Fig. 4A & 21A; col. 60, ll. 14-29).

As per independent claim 26, Chauvin discloses a method for transparency rendering . . . comprising: a) collecting colored-transparency information . . . (Fig. 3 & 5A; col. 18, ll. 50-60; col. 19, ll. 10-18); b) storing the collected color-transparency information in the form of a plurality of texture maps (col. 8, ll. 49-54; col. 31, ll. 45-50); c) rendering the opaque objects in the scene (col. 39, ll. 45-52); d) storing the rendering of the opaque objects in memory (col. 50, ll. 17-22; col. 51, ll. 15-19; col. 5, ll. 10-30); e) identifying one of the depth layers to be blended (col. 50, ll. 42-65); f) blending . . . from the identified depth layer . . . (col. 51, ll. 15-19); g) storing the results of f) in memory; and h) repeating acts e)-g) (col. 5, ll. 10-30; col. 51, ll. 35-67).

As per independent claim 27, Chauvin discloses a computer program product . . . (col. 7, ll. 30-41) for implementing the method of claim 26. Therefore the rationale applied in the rejection of claim 26 applies herein.

As per independent claim 28, Chauvin discloses a method for transparency rendering . . . comprising: a) collecting colored-transparency information . . . (col. 18, ll. 50-60; col. 19, ll. 10-18) by: i) executing a first rendering pass for generating a shadow map . . . relating to a first depth layer (col. 19 ll. 12-20, 50-52), and ii) executing additional rendering passes with a shadow-mapping feature enabled and from the same eye position . . . relating to additional depth layers (col. 22, ll. 30-40; Fig. 5A); b) storing the collected colored-transparency information in memory (Fig. 4A); and c) blending the colored-transparency information from the depth layers (col. 50, ll. 15-30).

As per independent claim 29, Chauvin discloses a computer program product . . . (col. 7, ll. 30-41) for implementing the method of claim 28. Therefore the rationale applied in the rejection of claim 28 applies herein.

Art Unit: 2672

***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chante Harrison whose telephone number is 703-305-3937. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chante Harrison  
Examiner  
Art Unit 2672

March 5, 2004



MICHAEL RAZAVI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2672